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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/429,719	10/29/99	ARATANI K	P99.2247

EXAMINER	
MCDONALD, R	
ART UNIT	PAPER NUMBER
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SONNENSCHEIN NATH & ROSENTHAL
P.O. BOX 061080
WACKER DRIVE STATION
CHICAGO IL 60606-1080

DATE MAILED: 10/25/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.	Applicant(s)
09/429,719	Aratani et al.
Examiner	**Art Unit**
Rodney McDonald	1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *Oct 15, 2001*.

2a) ☐ This action is **FINAL.** 2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1, 3-12, and 14-16* is/are pending in the application.

4a) Of the above, claim(s) *3-6, 8, and 9* is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *1, 7, 10-12, and 14-16* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

a) ☐ All b) ☐ Some* c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

15) ☐ Notice of References Cited (PTO-892)

16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). *10*

18) ☐ Interview Summary (PTO-413) Paper No(s). _____

19) ☐ Notice of Informal Patent Application (PTO-152)

20) ☐ Other:

DETAILED ACTION

Request for Continued Examination

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10-15-01 has been entered.

Claim Rejections - 35 USC § 112

2. Claims 10, 11, 12 and 14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 10, 11, 12 and 14 are indefinite because "the wavelength" lacks antecedent basis.

Claims 11 and 14 are indefinite because they depend on canceled claims.

Claim Rejections - 35 U.S.C. § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371© of this title before the invention thereof by the applicant for patent.

4. Claims 1, 10, 11 and 15 are rejected under 35 U.S.C. 102(e) as being anticipated by Nee (U.S. Pat. 6,007,899).

Nee teach that a particular silver-based alloy provides sufficient reflectivity and corrosion resistance to be used as the reflective or the semi-reflective layer in an optical storage medium, without the inherent cost of a gold-based alloy. (Column 6 lines 16-21)

The sliver is alloyed with a comparatively small amount of palladium. In this embodiment, the relationship between the amounts of palladium and silver ranges from about 0.1 a/o percent (atomic percent) to about 15 a/o percent palladium and from about 85 a/o percent to about 99.9 a/o percent silver. But preferably in respect to each metal, the alloy has from about 4 a/o percent to about 11 a/o percent palladium and from about 89 a/o percent to about 96 a/o percent silver. (Column 6 lines 30-38)

The above described binary or ternary alloy systems can be further modified by adding another element such as copper, which has an intrinsic reflectivity of more than 90 percent, or rhodium, which has an intrinsic reflectivity of about 80 percent. Copper is isomorphous with gold and palladium, but its solubility in silver is somewhat limited. Rhodium is isomorphous with palladium, but has very limited solubility in silver and gold. Therefore, if a single phase solid solution microstructure is desired in the sputtering target, the addition of copper or rhodium to the above silver-based binary or ternary alloy systems is limited to their respective solubility limits, which is about 5 a/o percent or less. However, this 5 a/o percent limit can be exceeded if a fast cooling rate is used both to make the sputtering target and to apply the target as a reflective film.

Thus, in total, the preferred concentration of copper or rhodium as an additive to the above-described silver-based, binary or ternary alloy systems can exceed 5 a/o percent and is from about 0.01 a/o percent to about 10.0 a/o percent. (Column 6 lines 60-67; Column 7 lines 1-11)

Having presented the preceding compositions for the starting materials, it is important to recognize that both the manufacturing process of the sputtering target and the process to deposit the target into a thin film play important roles in determining the final properties of the film. (Column 9 lines 38-42)

To this end, a preferred method of making the sputtering target will now be described. In general, vacuum melting and casting of the alloys or melting and casting under protective atmosphere, are preferred to minimize the introduction of other unwanted impurities. (Column 9 lines 43-47)

The alloys of this invention can be deposited in the well-known manners described earlier. Those being sputtering. (Column 10 lines 7-9)

In Column 11 lines 59 a reflective layer of Ag_xPd_t where $0.85<x< 0.999$ and $0.001<t<0.15$ is taught. In Column 12 lines 1-4 the reflective layer incorporates Cu where the composition of the deposited reflective layer is $Ag_xPd_tCu_z$ where $0.0001<z<0.10$.

Nee teach that a laser beam having a wavelength of 780 to 820 nanometers can be utilized to focus information on the reflective layer. (Column 1 lines 50-58) Their reflective layer can be used for further generations of optical disc that use a reading laser of a shorter wavelength,

for example, when reading laser's wavelength is shorter than 650 nanometers. (Column 10 lines 21-25)

The film thickness can be 5 to 20 nanometers. (Column 10 line 27) Film thickness can be about 50 to 100 nanometers. (Column 10 line 42)

Claim Rejections - 35 U.S.C. § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103© and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1, 10, 11 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nee (U.S. Pat. 6,007,889).

Nee is discussed above and all is as applied above.

The differences between Nee and the present claims is that the specific range of elements in the composition is not discussed, the specific thicknesses and the specific wavelengths of light utilized.

As to the specific range of compositions, thicknesses and specific wavelengths, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected the portion of the prior art's range which is within the range of applicant's claims because it has been held to be obvious to select a value in a known range by optimization for the best results, see In re Aller, et al., 105 U.S.P.Q. 233.

7. Claims 1 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hatwar et al. (U.S. Pat. 5,948,497) in view of Takeoka et al. (U.S. Pat. 4,647,947).

Hatwar et al. teach a reflecting layer that is a silver-palladium alloy, a silver-copper alloy or a silver-palladium-copper alloy. By maintaining the palladium component of the alloy less than 15 atomic % and the copper component of the alloy less than 30 atomic % the reflectance of the reflecting layer can be similar to the typical gold reflecting layer. (See Abstract)

The alloy thin films were prepared by co-sputtering silver and palladium and/or copper using d.c. magnetron guns in argon atmosphere. (Column 2 lines 33-35)

Complete compact disks were fabricated using silver alloys and gold films approximately 1000 Angstroms thick. (Column 2 lines 48-49)

The differences between Hatwar et al. and the present claims is that utilizing a single alloy target to deposit the alloy film is not discussed.

Takeoka et al. teach depositing a metal layer of gold (Au), platinum (Pt), palladium (Pd), rhodium (Rh), indium (Ir), copper (Cu), nickel (Ni), cobalt (Co), iron (Fe), manganese (Mn), chromium (Cr), vanadium (V), titanium (Ti), zirconium (Zr), niobium (Nb) and aluminum (Al) as well as silver. These metals may be used singly or ***as alloys of two or more components.*** It is particularly desirable to use noble metals such as gold, silver, platinum, palladium, rhodium and iridium or alloys of these metals. These metals may be deposited by means of vacuum deposition, electron beam deposition or ***sputtering***, ***using them as a target*** and argon gas for the plasma. (Column 7 lines 52-68)

The motivation for depositing from a target containing the metals (i.e. them) is that it allows for depositing a layer comprised of that alloy target. (Column 7 lines 52-68)

As to the specific range of compositions and thicknesses, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected the portion of the prior art's range which is within the range of applicant's claims because it has been held to be obvious to select a value in a known range by optimization for the best results, see In re Aller, et al., 105 U.S.P.Q. 233.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Hatwar et al. by utilizing a single target as taught by Takeoka et al. because it allows for depositing an alloy layer.

8. Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hatwar et al. in view of Takeoka et al. as applied to claims 1 and 15 above, and further in view of Ohno et al. (U.S. Pat. 6,004,646).

The differences not yet discussed is that wavelength utilized for recording.

Ohno et al. suggest that the wavelength for recording/retrieving is at a level of from 630 to 660 nm. (Column 19 lines 8-10)

The motivation for operating at the wavelength of from 630 to 660 nm is that it allows for recording/retrieving information. (Column 19 lines 8-10)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized a wavelength of from 630 to 660 nm as taught by Ohno et al. because it allows for recording/retrieving information.

9. Claims 7, 12 , 14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hatwar et al. (U.S. Pat. 5,948,497) in view of Ohno et al. (U.S. Pat. 6,004,646) and Takeoka et al. (U.S. Pat. 4,647,947).

Hatwar et al. is discussed above and teach a silver-palladium-copper alloy. (See Hatwar et al. discussed above)

The difference between Hatwar et al. and the present claims is that adding titanium to the reflective alloy layer is not discussed and sputtering the alloy from a single target is not discussed.

Ohno et al. teach that to obtain a low volume resistivity in a recording medium a substantially pure Al film having an impurity content of not more than 2 atomic % or a

substantially pure Au or Ag film having an impurity content of not more than 5 atomic % is preferred. (Column 10 lines 1-5)

When the above reflective layer is a thin film of an Ag alloy, one containing from 0.2 to 5 atomic % of Ti, V, Ta, Nb, W, Co, Cr, Si, Ge, Sn, Sc, Hf, Pd, Rh, Au, Pt, Mg, Zr, Mo, or Mn, is preferred. (Column 10 lines 23-26)

The present invention have confirmed that with the additive element to Al or the additive element to Ag, the volume resistivity increases in proportion to the concentration of the additive element. (Column 10 lines 29-32)

The reflective layer is made of a Ag alloy containing from 0.2 to 5 atomic % of at least one member selected from the group consisting of Ti, V, Ta, Nb, W, Co, Cr, Si, Ge, Sn, Sc, Hf, Pd, Rh, Au, Pt, Mg, Zr, Mo and Mn. (Column 39 lines 50-54) When archival stability is of importance, the additive component is preferably Ti or Mg. (Column 10 lines 26-28)

The reflective layer is usually formed by a sputtering method. (Column 10 lines 45-46)

The crystallizability or the impurity composition in the layer depends on the method for preparation of the alloy target used for the sputtering and the sputtering gas (Ar, Ne, Xe or the like). (Column 10 lines 64-67)

The wavelength for recording/retrieving is at a level of from 630 nm to 660 nm relative to 780 nm for CD-RW. (Column 19 lines 8-12)

The reflective layer has a thickness of from 40 to 300 nm. (See Abstract)

The motivation for adding Ti to the alloy layer is that it allows for improving the archival stability. (Column 10 lines 26-28)

Takeoka et al. is discussed above and teach sputtering from a target containing the required metals. (See Takeoka et al. discussed above)

The motivation for sputtering from a single target the metals (i.e. them) is that it allows for depositing a layer comprised of that alloy target. (Column 7 lines 52-68)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Hatwar et al. by utilizing Ti in the reflective layer as taught by Ohno et al. and to have utilized a single target as taught by Takeoka et al. because it allows for improving archival stability and for depositing an alloy layer.

REMARKS:

The Affidavit under 37 CFR 1.131:

The affidavit is defective because it lacks Exhibits A and B which are needed for proper consideration. It is suggested to perfect this in the next response for proper consideration. Until perfection the rejection to Nee will be maintained.

New 35 U.S.C. 103 rejections have been made above.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney McDonald whose telephone number is (703) 308-3807. The examiner can normally be reached on Monday through Thursday from 8:00 to 5:00. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen, can be reached on (703) 308-3322. The fax phone number for the organization where this application or proceeding is assigned is (703) 305-3599.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

RODNEY G. MCDONALD
PRIMARY EXAMINER

RM

10-23-01